S.N. 10/622916

IN THE CLAIMS

Please cancel claims 2-68 without prejudice.

1. (Once and presently amended) A method for removing oxygen contaminants from ammonia contaminated with oxygen, said method comprising the steps of contacting the oxygen contaminated ammonia with a ~~getter~~ oxygen removing material ~~including~~ consisting essentially of at least partially-reduced oxides of iron and manganese to sorb said oxygen contaminants from said contaminated ammonia. ~~to produce thereby ammonia substantially free of oxygen.~~

Please add the following claims.

69. (New). A method for removing oxygen from ammonia comprising the steps of:

thermally reducing hydroxides of iron and manganese to produces oxides of iron and manganese;

reducing said oxides of iron and manganese to produce an ammonia purification material, such that said purification material includes at least partially-reduced oxides of iron and manganese;

removing oxygen from an oxygen-contaminated ammonia stream with said purification material of iron and manganese, by contacting ammonia with said purification material, said removing step performed at less than 50C and greater than –20C.

70. (New) The method as recited in claim 69, further comprising a pretreatment step of adding zeolites.

71. (New) The method as recited in claim 69, wherein said reducing step takes place between 200 and 400 degrees C.

72. (New) The method as recited in claim 69, where said thermally reducing step takes place at 350 degrees C.

73. (New). The method as recited in claim 69, further comprising the act of pre-treating salts of iron and manganese to produce hydroxides of iron and manganese.

74. (new). A method of making a getter for removing oxygen contaminants from ammonia, said method comprising:

a step for pre-treating hydroxides of iron and manganese;

a step for decomposing said hydroxides of iron and manganese into oxides of iron and manganese, respectively; and

a step for exposing said oxides of iron and manganese first to a hydrogen stream and then to an argon stream resulting in said getter for removing oxygen,

wherein said getter is capable of removing oxygen from ammonia at temperatures below 50 degrees centigrade.

```
=> fil hca
FILE 'HCA' ENTERED AT 13:08:52 ON 03 DEC 2004
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FILE COVERS 1907 - 25 Nov 2004 VOL 141 ISS 23
FILE LAST UPDATED: 25 Nov 2004  (20041125/ED)
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This file contains CAS Registry Numbers for easy and accurate substance identification.

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=> d que l47
L5             9 SEA FILE=REGISTRY ABB=ON  PLU=ON  (1304-28-5/BI OR
1305-78-8/BI
                  OR 1314-11-0/BI OR 1344-28-1/BI OR 7439-89-6/BI OR
7439-96-5/B
                  I OR 7631-86-9/BI OR 7664-41-7/BI OR 7782-44-7/BI)
L6             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  L5 AND AMMONIA/CN
L7             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  L5 AND OXYGEN/CN
L8             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  L5 AND MANGANESE/CN
L9             1 SEA FILE=REGISTRY ABB=ON  PLU=ON  L5 AND IRON/CN
L10       350262 SEA FILE=HCA ABB=ON  PLU=ON  L6 OR AMMONIA OR NH3
L12       555126 SEA FILE=HCA ABB=ON  PLU=ON  L8 OR MANGANESE OR MN
L13      1216275 SEA FILE=HCA ABB=ON  PLU=ON  L9 OR IRON OR FE
L14      1898750 SEA FILE=HCA ABB=ON  PLU=ON  L7 OR OXYGEN OR O2 OR O
L22        21957 SEA FILE=HCA ABB=ON  PLU=ON  L10(L)(PUR OR PREP)/RL
L23       114798 SEA FILE=HCA ABB=ON  PLU=ON  L14(L)(REM OR PROC)/RL
L24          165 SEA FILE=HCA ABB=ON  PLU=ON  L22 AND L23
L25           11 SEA FILE=HCA ABB=ON  PLU=ON  L24 AND L12
L27           35 SEA FILE=HCA ABB=ON  PLU=ON  L24 AND L13
L28           40 SEA FILE=HCA ABB=ON  PLU=ON  L25 OR L27
L29         6396 SEA FILE=HCA ABB=ON  PLU=ON  L10 AND L14 AND (L12 OR L13)
L37          357 SEA FILE=HCA ABB=ON  PLU=ON  L10(5A)(DEOXYGENAT? OR
(?SORB? OR
                  REMOV?)(3A) L14)
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L38           52 SEA FILE=HCA ABB=ON  PLU=ON  L29 AND (CONTAMIN? OR
IMPUR?)(4A)
                 L14
L40           44 SEA FILE=HCA ABB=ON  PLU=ON  L37 AND L29
L41           95 SEA FILE=HCA ABB=ON  PLU=ON  L40 OR L38
L42          126 SEA FILE=HCA ABB=ON  PLU=ON  L41 OR L28
L43        10458 SEA FILE=HCA ABB=ON  PLU=ON  L14(L)REM/RL
L44           30 SEA FILE=HCA ABB=ON  PLU=ON  L43 AND L42
L45           23 SEA FILE=HCA ABB=ON  PLU=ON  L44 AND L13
L46         5295 SEA FILE=HCA ABB=ON  PLU=ON  L7(L)REM/RL
L47           15 SEA FILE=HCA ABB=ON  PLU=ON  L46 AND L45


=> fil wpix
FILE 'WPIX' ENTERED AT 13:09:30 ON 03 DEC 2004
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FILE LAST UPDATED:          25 NOV 2004      <20041125/UP>
MOST RECENT DERWENT UPDATE:     200476        <200476/DW>
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    HIT STRUCTURES WITHIN THE BIBLIOGRAPHIC DOCUMENT  <<<

>>> SMILES and ISOSMILES strings are no longer available as
    Derwent Chemistry Resource display fields  <<<

=> d que l49
L48           64 SEA FILE=WPIX ABB=ON  PLU=ON  AMMONIA(5A)(DEOXYGENAT? OR
                 (?SORB? OR REMOV?)(3A) OXYGEN)
L49            5 SEA FILE=WPIX ABB=ON  PLU=ON  L48 AND (MANGANESE OR IRON)
```

```
=> fil compendex
FILE 'COMPENDEX' ENTERED AT 13:10:06 ON 03 DEC 2004
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FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
    THE BASIC INDEX >>>

=> d que l50
L48           64 SEA FILE=WPIX ABB=ON  PLU=ON  AMMONIA(5A)(DEOXYGENAT? OR
                 (?SORB? OR REMOV?)(3A) OXYGEN)
L50            1 SEA FILE=COMPENDEX ABB=ON  PLU=ON  L48 AND (MANGANESE OR
IRON)



=> fil jicst
FILE 'JICST-EPLUS' ENTERED AT 13:10:44 ON 03 DEC 2004
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FILE COVERS 1985 TO 22 NOV 2004 (20041122/ED)

THE JICST-EPLUS FILE HAS BEEN RELOADED TO REFLECT THE 1999 CONTROLLED
TERM (/CT) THESAURUS RELOAD.

=> d que 52
'52' IS NOT VALID HERE
For an explanation, enter "HELP DISPLAY QUERY".

=> d que 152
L52            2 SEA FILE=JICST-EPLUS ABB=ON  PLU=ON
AMMONIA(5A)(DEOXYGENAT?
                 OR (SORB? OR REMOV?)(3A) OXYGEN)


=> dup rem  147 149 150 152
FILE 'HCA' ENTERED AT 13:12:41 ON 03 DEC 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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FILE 'COMPENDEX' ENTERED AT 13:12:41 ON 03 DEC 2004

FILE 'JICST-EPLUS' ENTERED AT 13:12:41 ON 03 DEC 2004

PROCESSING COMPLETED FOR L47
PROCESSING COMPLETED FOR L49
PROCESSING COMPLETED FOR L50
PROCESSING COMPLETED FOR L52
L54 22 DUP REM L47 L49 L50 L52 (1 DUPLICATE REMOVED)

=> dis l54 1-22 ibib abs hitind

L54 ANSWER 1 OF 22 HCA
ACCESSION NUMBER: 141:73674 HCA
TITLE: Methods for regenerating process gas purifier materials
INVENTOR(S): Torres, Robert; Vininski, Joseph; Lawrence, David
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004123736	A1	20040701	US 2003-651644	20030828
PRIORITY APPLN. INFO.:			US 2002-407124P P	20020830

AB A continuous method of producing a process fluid gas from a feed stream comprising the process fluid and impurities is provided, comprising: (a) providing a first and second vessel, each vessel containing one or more regenerable purifier materials for removing at least one of said impurities from said feed stream; (b) removing at least one of said impurities by passing said feed stream through one or the other of said vessels to provide said purified process fluid gas, said vessel being maintained at a first temperature during said removal of said at least one of

said impurities; and (c) regenerating said one or more purifier materials in each of said vessels at a second temperature and during the a time when it is not purifying said feed stream by flowing a portion of said purified process fluid or said feed stream or a sep. source of said process fluid gas therethrough. The process fluids to be purified may be a hydride such as ammonia, a hydrocarbon, halocarbon, an oxide of nitrogen, a halogenated fluid, a sulfur-containing fluid, or an amine. At least one of said purifier materials is an alloy or oxide of V, Mo, Sb, Bi, Sn, Ce, Cr, Co, Cu, W, **Fe**, **Mn**, Ni, Zr, Hf, Nb, Ta, Tc, Os, Rh, Ir, Ag, Cd, Hg or mixts. thereof. The impurities able to be removed by this process include: moisture, carbon dioxide, siloxanes, germane, silane, hydrogen sulfide, oxygen, carbon monoxide and tetraethoxysilane. The invention is particularly applicable to the purification of ammonia as a process gas for semiconductor manufacturing

IC ICM B01D053-02
NCL 095116000; 095148000; 095133000
CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 67, 76
IT 1304-76-3, Bismuth oxide, uses 1306-19-0, Cadmium oxide, uses 1313-96-8, Niobium oxide 1313-99-1, Nickel oxide, uses 1314-23-4, Zirconium oxide, uses 1314-35-8, Tungsten oxide, uses 1314-61-0, Tantalum oxide 1327-33-9, Antimony oxide 1332-29-2, Tin oxide 1332-37-2, **Iron** oxide, uses 1344-70-3, Copper oxide 7439-88-5D, Iridium, alloys **7439-89-6D**, **Iron**, alloys **7439-96-5D**, **Manganese**, alloys 7439-97-6D, Mercury, alloys 7439-98-7D, Molybdenum, alloys 7440-02-0D, Nickel, alloys 7440-03-1D, Niobium, alloys 7440-04-2D, Osmium, alloys 7440-16-6D, Rhodium, alloys 7440-22-4D, Silver, alloys 7440-25-7D, Tantalum, alloys 7440-26-8, Technetium, uses 7440-26-8D, Technetium, alloys 7440-31-5D, Tin, alloys 7440-33-7D, Tungsten, alloys 7440-36-0D, Antimony, alloys 7440-43-9D, Cadmium, alloys 7440-45-1D, Cerium, alloys 7440-47-3D, Chromium, alloys 7440-48-4D, Cobalt, alloys 7440-50-8D, Copper, alloys 7440-58-6D, Hafnium, alloys 7440-62-2D, Vanadium, alloys 7440-67-7D, Zirconium, alloys 7440-69-9D, Bismuth, alloys 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11118-57-3, Chromium oxide 11129-18-3, Cerium

oxide 11129-60-5, **Manganese** oxide 12055-23-1, Hafnium oxide 12645-46-4, Iridium oxide 12653-71-3, Mercury oxide 12680-36-3, Rhodium oxide 20667-12-3, Silver oxide 20816-12-0, Osmium oxide
RL: CAT (Catalyst use); USES (Uses)
(methods for regenerating process gas purifier materials and application to semiconductor device fabrication processes)

IT **7664-41-7P**, **Ammonia**, preparation 7704-34-9DP, Sulfur, compds.
RL: **PUR (Purification or recovery); PREP (Preparation)**
(methods for regenerating process gas purifier materials and application to semiconductor device fabrication processes)

IT 78-10-4, Tetraethoxysilane 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes 7732-18-5, Water, processes **7782-44-7**, **Oxygen**, processes 7782-65-2, Germane 7783-06-4, Hydrogen sulfide, processes 7803-62-5, Silane, processes
RL: **REM (Removal or disposal); PROC (Process)**
(methods for regenerating process gas purifier materials and application to semiconductor device fabrication processes)

L54 ANSWER 2 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
ACCESSION NUMBER: 2004-374908 [35] WPIX
DOC. NO. CPI: C2004-140936
TITLE: Purification of ammonia comprises contacting a crude ammonia with purification agent such as **manganese** oxide and metal oxide as effective component.
DERWENT CLASS: E35 J01
INVENTOR(S): ARAKAWA, S; IKEDA, T; KASAYA, T; OTSUKA, K
PATENT ASSIGNEE(S): (NIPI-N) NIPPON PIONICS CO LTD; (ARAK-I) ARAKAWA S; (IKED-I) IKEDA T; (KASA-I) KASAYA T; (OTSU-I) OTSUKA K
COUNTRY COUNT: 3
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
US 2004091413	A1	20040513	(200435)*		17
JP 2004142987	A	20040520	(200435)		22
CN 1498853	A	20040526	(200458)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 2004091413	A1	US 2003-691697	20031024
JP 2004142987	A	JP 2002-309134	20021024
CN 1498853	A	CN 2003-1101744	20031022

PRIORITY APPLN. INFO: JP 2002-309134 20021024
AN 2004-374908 [35] WPIX
AB US2004091413 A UPAB: 20041125
NOVELTY - An ammonia is purified by contacting a crude ammonia with purification agent such as **manganese** oxide and metal oxide as effective component. The metal oxide can be vanadium oxide, chromium oxide, tin oxide, zirconium oxide, bismuth oxide, niobium oxide, or tantalum oxide. The ratio of number of **manganese** atom to entire metallic atoms of the effective component is 80 to 99%.

USE - For purifying an **ammonia** to **remove** impurities e.g. **oxygen**, carbon monoxide, carbon dioxide or moisture, from crude ammonia.

ADVANTAGE - The inventive process utilizes purification agent that may be reproduced without reducing its capability of removing impurities in crude ammonia.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic view of a purification line to carry out the inventive process.

Purification agent 1
Purification column 3
Numerical symbols 6, 7

Dwg.1/3

L54 ANSWER 3 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
ACCESSION NUMBER: 2004-111392 [12] WPIX
DOC. NO. NON-CPI: N2004-088713
DOC. NO. CPI: C2004-045437
TITLE: Adsorbent for removing water and/or other oxygen-containing impurities from fluid comprising ammonia in purification apparatus, comprises compound, e.g. ammonium sulfate, disposed within portion of porous substrate.
DERWENT CLASS: E35 E36 J01 L03 U11
INVENTOR(S): DONG, C C; RAO, M B; WU, D
PATENT ASSIGNEE(S): (AIRP) AIR PROD & CHEM INC; (DONG-I) DONG C C; (RAOM-I) RAO M B; (WUDD-I) WU D
COUNTRY COUNT: 33
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
EP 1380339	A1	20040114	(200412)*	EN	14

R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV

MC MK NL PT RO SE SI SK TR
US 2004009873 A1 20040115 (200412)
KR 2004005641 A 20040116 (200434)

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
EP 1380339	A1	EP 2003-14475	20030702
US 2004009873	A1	US 2002-191719	20020709
KR 2004005641	A	KR 2003-45963	20030708

PRIORITY APPLN. INFO: US 2002-191719 20020709
AN 2004-111392 [12] WPIX
AB EP 1380339 A UPAB: 20040218
NOVELTY - An adsorbent (50) for removing water from a fluid comprising ammonia, comprises a substrate having pores and a surface area that is 100-2500 m2/g; and a compound disposed within a portion of the substrate.
The compound comprises cation(s) from e.g. ammonium (I) or lithium (I), that is ionically associated with an anion from halide, sulfide, sulfite or sulfate.
DETAILED DESCRIPTION - An adsorbent for removing water from a fluid comprising ammonia, comprises a substrate having pores and a surface area that is 100-2500 m2/g; and a compound disposed within a portion of the substrate. The compound comprises cation(s) from ammonium (I), lithium (I), sodium (I), potassium (I), cesium (I), magnesium (II), calcium (II), strontium (II), barium (II), **manganese** (II), nickel (II), **iron** (II), zinc (II), aluminum (III), indium (III), **iron** (III) and/or zirconium (IV), that is ionically associated with an anion from halide, sulfide, sulfite or sulfate. INDEPENDENT CLAIMS are also included for:
(a) an purification apparatus (10) for removing water from ammonia comprising the adsorbent;
(b) preparation of an adsorbent comprising providing a mixture comprising cation(s) and anion; impregnating a porous substrate with the mixture to form an adsorbent; and heating the adsorbent precursor to at least 100 deg. C in a gaseous atmosphere to form the adsorbent; and

(c) removal of water from a fluid comprising ammonia and water, the
water contained within the fluid is at a partial pressure of 10-9 to 9
multiply 10-4 atm by passing the fluid over an adsorbent comprising 10-80
weight% compound disposed in a portion of a porous substrate at neg. 40 - 70
deg. C.
USE - For removing water and/or other oxygen-containing impurities
from a fluid comprising ammonia in purification apparatus (claimed).
ADVANTAGE - The adsorbent purifies ammonia to the ppb level, has high
sorption capacity and faster sorption kinetic, operates effectively at
ambient temperatures, can avoid the introduction of additional
contaminants to ammonia during the purification process, and requires
fewer process steps to manufacture, and has lower activation temperatures.
DESCRIPTION OF DRAWING(S) - The figure is a purification apparatus
that contains an adsorbent.
Purification apparatus 10
Fluid inlet 20
Chamber 30
Fluid outlet 40
Adsorbent 50
Inlet valve 60
Outlet valve 70
Dwg.1/2

L54 ANSWER 4 OF 22 COMPENDEX COPYRIGHT 2004 EEI on STN
ACCESSION NUMBER: 2004(19):2109 COMPENDEX
TITLE: Application of coagulation and conventional filtration
in raw water pretreatment before microfiltration membranes.
AUTHOR: Sakol, Dorota (PKE S.A. Lagisza Power Plant Water and
Chemical Department, Bedzin 42-504, Poland); Konieczny, Krystyna
SOURCE: Desalination v 162 n 1-3 Mar 10 2004 2004.p 61-73
CODEN: DSLNAH ISSN: 0011-9164
PUBLICATION YEAR: 2004
DOCUMENT TYPE: Journal
TREATMENT CODE: Application; Experimental
LANGUAGE: English
AN 2004(19):2109 COMPENDEX
AB Two step coagulation using **iron** coagulant (FeCl3) with anionic

polyelectrolyte in the first step and aluminum coagulant in the second one was made to reduce the negative effect of the fouling phenomenon. The process was operated on the commercial scale. The raw water was the blowdown water from the power plant cooling system. The dead-end microfiltration units provided with 0.2 mum polypropylene membranes produced about 210 m3/h of water. The results of statistical tests show a significant difference between the concentrations of turbidity, total hardness, sulfates (VI), total **iron**, aluminum, silica, nitrate nitrogen, **ammonia** nitrogen, **oxygen** consumption and **absorbance** (254 nm) in the water during the whole process. The results of previous observations showed that the formation of the cake layer had been the main reason for the fouling phenomenon occurring on the investigated membranes. It is significant that 75% of the suspension has been removed during the pretreatment stages. The hydrobiological observations show the presence of Bacillariophyceae and Cyanophyta. It is possible to remove them during the coagulation and prefiltration stages. The investigation results show that it is possible to protect the polypropylene membrane from fouling occurring inside the membrane pores as well as the formation of the cake layer. The use of a hybrid process combining the traditional raw water pretreatment with a membrane process may be well-founded. 16 Refs.

L54 ANSWER 5 OF 22 HCA
ACCESSION NUMBER: 138:355691 HCA
TITLE: Materials and methods for the purification of inert, nonreactive, and reactive gases
INVENTOR(S): Watanabe, Tadaharu; Fraenkel, Dan; Torres, Robert, Jr.
PATENT ASSIGNEE(S): Matheson Tri-Gas, Inc., USA
SOURCE: PCT Int. Appl., 25 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003037484	A1	20030508	WO 2002-US35006	20021030

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2003094098	A1	20030522	US 2002-284423	20021029
US 6824589	B2	20041130		

PRIORITY APPLN. INFO.: US 2001-336327P P 20011031
US 2002-284423 A 20021029

AB Regenerable gas purifier materials are provided capable of reducing the level of **contaminants** such as **oxygen** and water in an inert, nonreactive or reactive gas streams to parts-per-billion levels or sub-parts-per-billion levels. The purifier materials comprise a thin layer of one or more reduced forms of a metal oxide coated on the surface of a nonreactive substrate. The thin layer may further contain the completely reduced form of the metal.

IC ICM B01D053-02
CC 48-3 (Unit Operations and Processes)
IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes 1333-74-0, Hydrogen, processes 2551-62-4, Sulfur fluoride (SF6) 7439-90-9, Krypton, processes 7440-01-9, Neon, processes 7440-37-1, Argon, processes 7440-63-3, Xenon, processes 7446-09-5, Sulfur dioxide, processes 7446-11-9, Sulfur trioxide, processes 7727-37-9, Nitrogen, processes 7732-18-5, Water, processes **7782-44-7**, **Oxygen**, processes 7783-06-4, Hydrogen sulfide (H2S), processes 7783-54-2, Nitrogen fluoride (NF3) 10024-97-2, Nitrogen oxide (N2O), processes 10043-92-2, Radon, processes 10102-43-9, Nitric oxide,

processes 10102-44-0, Nitrogen dioxide, processes 10544-72-6, Nitrogen
oxide (N2O4) 13827-32-2, Sulfur oxide (SO) 53238-43-0, Sulfur oxide
(S2O2)
RL: **REM (Removal or disposal)**; PROC (Process)
(regenerable materials and methods for the purification of inert, nonreactive, and reactive gases)
IT 1304-76-3, Bismuth oxide, uses 1313-99-1, Nickel oxide (NiO), uses
1314-23-4, Zirconia, uses 1314-35-8, Tungsten oxide, uses 1327-33-9,
Antimony oxide 1332-29-2, Tin oxide 1332-37-2, **Iron** oxide, uses
1344-28-1, Alumina, uses 1344-70-3, Copper oxide 7440-44-0, Carbon, uses
7631-86-9, Silica, uses **7664-41-7**, **Ammonia**, uses 11098-99-0, Molybdenum oxide 11104-61-3, Cobalt oxide 11118-57-3, Chromium oxide 11129-18-3, Cerium oxide 11129-60-5, **Manganese** oxide 13463-67-7, Titania, uses 16833-27-5, Oxide 159995-97-8, Aluminum silicon oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(regenerable materials and methods for the purification of inert, nonreactive, and reactive gases)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 6 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 135:48211 HCA
TITLE: System and method for purifying and distributing chemical gases
INVENTOR(S): Udischas, Richard; Xu, Mindi; Schnepper, Carol; Paganessi, Joseph
PATENT ASSIGNEE(S): Air Liquide SA pour l'Etude et l'Exploitation des Procedes Georges Claude, Fr.
SOURCE: PCT Int. Appl., 32 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001045819	A1	20010628	WO 2000-US41439	20001024

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,

HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,
CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

US 6395064 B1 20020528 US 1999-426875 19991026
PRIORITY APPLN. INFO.: US 1999-426875 A 19991026

AB Distribution system vaporizes and purifies a liquefied gas from bulk tank to produce ultrapure chemical gases for user station. Bulk tank is in flow communication with a vaporization purification bed that generates the ultrapure chemical gas, which is subsequently routed to buffer tank, before passage to the user station. The pressure and temperature in vaporization purification bed are controlled so that droplets formed by a spray nozzle evaporate very rapidly and are converted into gas, while impurities in the liquid are left behind in the form of solid particles.

IC ICM B01D019-00
CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 47, 76
IT 74-82-8, Methane, processes 630-08-0, Carbon monoxide, processes **7439-89-6, Iron**, processes 7440-02-0, Nickel, processes 7440-23-5, Sodium, processes 7440-43-9, Cadmium, processes 7440-47-3, Chromium, processes 7440-50-8, Copper, processes 7440-66-6, Zinc, processes 7723-14-0, Phosphorus, processes 7727-37-9, Nitrogen, processes **7782-44-7, Oxygen**, processes
RL: POL (Pollutant); **REM (Removal or disposal)**; OCCU (Occurrence); **PROC (Process)**
(system and method for purifying and distributing chemical gases)
IT 2551-62-4P, Sulfur hexafluoride 7647-01-0P, Hydrogen chloride, uses **7664-41-7P, Ammonia**, uses 10024-97-2P, Nitrous oxide, uses 10035-10-6P, Hydrogen bromide, uses

RL: **PUR (Purification or recovery)**; TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(system and method for purifying and distributing chemical gases)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 7 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 132:154019 HCA
TITLE: Purification of **ammonia**
INVENTOR(S): Miyano, Yasusada; Otsuka, Kenji; Waki, Hiroshi
PATENT ASSIGNEE(S): Japan Pionics, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000044228	A2	20000215	JP 1998-217168	19980731

PRIORITY APPLN. INFO.: JP 1998-217168 19980731

AB In **removing** of **O**, CO, and/CO2 from **NH3** by Ni catalysts, a H-containing gas is generated by treating **NH3** with its decomposition catalysts under heating in order to regenerate the Ni catalyst used above. The decomposition catalyst may contain Ni, **Fe**, Ru, Pd, and/or Pt. The process is useful for H- and N-supplying-free regeneration of Ni catalysts and useful for semiconductor manufacturing

IC ICM C01C001-02
ICS B01J023-72; B01J023-90; B01J038-10
CC 49-8 (Industrial Inorganic Chemicals)
Section cross-reference(s): 76
ST **ammonia** purifn nickel catalyst regeneration; decompn **ammonia** hydrogen regeneration catalyst
IT Catalysts
Decomposition catalysts
Purification
Semiconductor device fabrication
(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for **removing** of **O**, CO, and CO2 for semiconductor manufacturing)
IT **7439-89-6**, **Iron**, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-18-8,

Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for **removing** of **O**, CO, and CO2 for semiconductor manufacturing)

IT 1333-74-0P, Hydrogen, preparation
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation); PROC (Process)**
(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for **removing** of **O**, CO, and CO2 for semiconductor manufacturing)

IT **7664-41-7P, Ammonia**, preparation
RL: **PUR (Purification or recovery); PREP (Preparation)**
(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for **removing** of **O**, CO, and CO2 for semiconductor manufacturing)

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes
7782-44-7, Oxygen, processes
RL: **REM (Removal or disposal); PROC (Process)**
(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for **removing** of **O**, CO, and CO2 for semiconductor manufacturing)

L54 ANSWER 8 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 130:129222 HCA
TITLE: Process and apparatus for removal of nitrogen trifluoride from waste gases
INVENTOR(S): Jinbo, Takashi; Yasutake, Takeshi; Harada, Isao; Wachi, Hiroko
PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11019471	A2	19990126	JP 1997-174476	19970630

PRIORITY APPLN. INFO.: JP 1997-174476 19970630

AB The title process comprises mixing NF3- and **O**-containing waste gases with reducing gases after removing at least a part of **O** from the gases. The reducing gas may be H or **NH3**. The reaction may be carried out in the presence of catalysts such as **Fe**, Co, Ni, Cu,

Zn, Ru, Rh, Pd, Ag, Ir, Pt, and/or Au at 0-600°. The title apparatus has a waste gas inlet, an **O** separation unit, a reactor for reduction, and
a unit to remove the F compds. generated. The process is useful for removal of NF3 from cleaning gases in semiconductor manufacturing

IC ICM B01D053-68
ICS B01D053-86

CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 47, 67, 76

ST nitrogen fluoride redn **oxygen** removal; catalyst redn nitrogen fluoride waste gas; semiconductor cleaning waste nitrogen fluoride redn;
reactor catalytic redn nitrogen fluoride removal

IT Reactors
(catalytic; removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT Detoxification
Reduction
Reduction catalysts
Waste gases
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT Semiconductor devices
(waste gas from cleaning of; removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT 7439-88-5, Iridium, uses **7439-89-6, Iron**, uses
7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses
RL: CAT (Catalyst use); USES (Uses)
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT 1333-74-0, Hydrogen, uses **7664-41-7, Ammonia**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**removal** of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT **7782-44-7, Oxygen**, processes 7783-54-2, Nitrogen trifluoride
RL: **REM (Removal or disposal)**; PROC (Process)
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

L54 ANSWER 9 OF 22 HCA COPYRIGHT 2004 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 126:227230 HCA
TITLE: Process and getter material for **removing oxygen** from flowing **ammonia** at room temperature

INVENTOR(S): Vergani, Giorgio; Succi, Marco; Solcia, Carolina
PATENT ASSIGNEE(S): Saes Getters S.P.A., Italy
SOURCE: PCT Int. Appl., 11 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9706104	A1	19970220	WO 1996-IT158	19960802
W: CN, JP, KR				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5716588	A	19980210	US 1996-686583	19960726
EP 784595	A1	19970723	EP 1996-926569	19960802
EP 784595	B1	19980513		
R: BE, DE, FR, GB, IT, NL, SE				
CN 1161031	A	19971001	CN 1996-190860	19960802
CN 1078871	B	20020206		
JP 10507735	T2	19980728	JP 1997-508285	19960802
JP 3231781	B2	20011126		
US 6776970	B1	20040817	US 1997-961792	19971031

PRIORITY APPLN. INFO.: IT 1995-MI1756 A 19950807
US 1996-686583 A1 19960726
WO 1996-IT158 W 19960802

AB In this process, in which **O** is removed with a getter material at room temperature, the flowing **NH3** is contacted with a getter material consisting of a mixture of metallic **Fe** and **Mn** (sp. surface area .gtorsim.100 m2/g) in weight ratio (1-7):1. The getter material is supported on, e.g., zeolites, porous Al2O3, porous SiO2, and other mol. sieves. Addnl., the **NH3** is contacted with a drying agent selected from BaO, CaO, SrO, and zeolites 3A. The resulting **NH3** is especially suitable for use in semiconductor manufacture

IC ICM C01C001-02
CC 49-8 (Industrial Inorganic Chemicals)
Section cross-reference(s): 76
ST **iron manganese** powder **oxygen** getter; semiconductor **ammonia oxygen** getter support; zeolite porous support **oxygen** getter; alumina porous support **oxygen** getter; silica porous support **oxygen** getter; mol sieve support **oxygen** getter; drying agent **oxygen**

getter **ammonia**; barium oxide drying agent; calcium oxide drying agent; strontium oxide drying agent

IT Getters
(**iron-manganese** powder; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT Drying agents
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT Semiconductor materials
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature for manufacture of)

IT Molecular sieves
(supports; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT Zeolites (synthetic), uses
RL: NUU (Other use, unclassified); USES (Uses)
(supports; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 1304-28-5, Barium oxide, properties 1305-78-8, Calcia, properties 1314-11-0, Strontium oxide, properties
RL: PRP (Properties)
(drying agent; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT **7439-96-5, Manganese**, properties
RL: PRP (Properties)
(powder, admixts. with **iron** powder; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT **7439-89-6, Iron**, properties
RL: PRP (Properties)
(powder, admixts. with **manganese** powder; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT **7664-41-7P, Ammonia**, preparation
RL: **PUR (Purification or recovery); PREP (Preparation)**
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT **7782-44-7, Oxygen**, processes
RL: **REM (Removal or disposal); PROC (Process)**
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses
RL: NUU (Other use, unclassified); USES (Uses)
(supports, porous; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

L54 ANSWER 10 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 127:250206 HCA
TITLE: Method and apparatus comprising two alternating purifier beds for removing impurities from specialty gases at ambient temperatures
INVENTOR(S): Carrea, Giovanni; Warrick, Brian D.; Wickman, Lewis J.
PATENT ASSIGNEE(S): Ultrapure Systems, Inc., USA
SOURCE: PCT Int. Appl., 16 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9731699	A1	19970904	WO 1997-US3226	19970228
W: AU, CA, CN, JP, KR, MX, RU, SG				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5833738	A	19981110	US 1996-609240	19960301
AU 9719829	A1	19970916	AU 1997-19829	19970228

PRIORITY APPLN. INFO.: US 1996-609240 A 19960301
WO 1997-US3226 W 19970228

AB The method comprises contacting the specialty gas with a purifier in a 1st vessel and at the same time regenerating the purifier in a 2nd vessel. The method and apparatus remove impurities from bulk-source specialty gases to levels of <10 ppb. This system is suitable for purifying corrosive and noncorrosive specialty gases. Depending on whether corrosive or noncorrosive gases are being purified and on the contaminants of concern, the purification beds contain an absorber and/or getter. Water and CO2 are removed from, e.g., NH3, using a bed of zeolite 13X.

IC ICM B01D053-04
CC 49-8 (Industrial Inorganic Chemicals)
ST gas purifn zeolite alloy getter; **iron** tin zirconium alloy getter; ammonia purifn zeolite alloy getter; water carbon dioxide ammonia purifn
IT **7664-41-7P, Ammonia**, preparation
RL: **PUR (Purification or recovery); PREP (Preparation)**

(method and apparatus comprising two alternating purifier beds for removing
impurities from specialty gases at ambient temps.)
IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes
7782-44-7, Oxygen, processes
RL: **REM (Removal or disposal); PROC (Process)**
(method and apparatus comprising two alternating purifier beds for removing
impurities from specialty gases at ambient temps.)

L54 ANSWER 11 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 123:323970 HCA
TITLE: The impurity processing system for the JET Active Gas
Handling System - inactive commissioning
AUTHOR(S): Lupo, J.; Hemmerich, J. L.; Lasser, R.; Yorkshades,
J.; Salanave, J. L.
CORPORATE SOURCE: JET Joint Undertaking, Abingdon, Oxfordshire, OX14 3EA, UK
SOURCE: Fusion Technology (1995), 28(3, Pt. 2), 1347-52
CODEN: FUSTE8; ISSN: 0748-1896
PUBLISHER: American Nuclear Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The Impurity Processing (IP) system is designed to recover tritium from
tritiated compds. (Q2O, CxQy, NQ3, with Q = H, D, T and $x \geq 1$, $y \geq 4$) collected from the JET torus or generated during the processing of gases inside the Active Gas Handling System (AGHS). The recovery process involves dilution of the **impurities** in helium, addition of **oxygen**, recirculation of the helium-**impurities**-**oxygen** mixture over a hot recombiner (773 K) to generate water and CO2, and trapping of the water on 160 K cold surfaces. The remaining
gas species He, CO2, **O2**, N2 (with a very small tritium concentration) are transferred finally to the Exhaust Detritiation (ED) system for further reduction of the tritium concentration by at least a factor of 1000. The
cold trap is heated (473 K) and the water vapor passed over two hot **iron** beds at 823 K to "crack" the water. The recovered hydrogen isotopes are stored in cold uranium beds (U-beds) for further processing
in AGHS.
CC 71-2 (Nuclear Technology)
IT **7439-89-6, Iron**, uses 7440-61-1, Uranium, uses
RL: NUU (Other use, unclassified); USES (Uses)

(beds; impurity processing system for the JET tokamak Active Gas Handling System)

IT 74-82-8, Methane, processes 558-20-3, Methane (CD4) 676-95-9, Methane-t4 **7664-41-7, Ammonia**, processes 7727-37-9, Nitrogen, processes **7782-44-7, Oxygen**, processes 7789-20-0, Water-d2 13550-49-7, **Ammonia** (ND3) 14940-65-9, Water (T2O) 15070-37-8, **Ammonia**, t3
RL: **REM (Removal or disposal)**; PROC (Process)
(**impurity** processing system for the JET tokamak Active Gas Handling System)

L54 ANSWER 12 OF 22 JICST-EPlus COPYRIGHT 2004 JST on STN
ACCESSION NUMBER: 970106026 JICST-EPlus
TITLE: Studies on an air-fluidized-bed biofilm reactor system by dynamic models.
AUTHOR: TSUBONE TOSHIAKI
TAKAHASHI MASAHIRO
ISHII MASATOSHI
CORPORATE SOURCE: NKK Corp.
Minist. of Constr. Public Work. Res. Inst.
Nihon Suido Consult.
SOURCE: Kankyo Kogaku Kenkyu Ronbunshu (Proceedings of Environmental Engineering Research), (1995) vol. 32, pp. 359-370. Journal Code: G0420B (Fig. 14, Tbl. 3, Ref. 12)
ISSN: 1341-5115
PUB. COUNTRY: Japan
DOCUMENT TYPE: Conference; Article
LANGUAGE: Japanese
STATUS: New

AB A mathematical model for the Air-Fluidized-Bed Biofilm Reactor(AFBBR) was developed based on soluble BOD(S-BOD) removal rate, **ammonia** nitrogen **removal** rate, **oxygen** consumption rate and oxygen transfer rate. The caluculated values agreed well with the mesured values. And then simulations were made to evaluate the effect of air feed rate control on the AFBBR by using this model and following results were obtained. Comparing with the constant and equal air feed to every stage of AFBBR, 1) tapered aeration had no advantages and no disadvantages, 2) proportional air feed rate control was effective against the change in the influent feed rate, but not effective against the change in the influent

concentration, 3) DO control was effective even when the DO was controlled at only one stage of the AFBBR. And based on the results about the oxygen consumption in this system, the value of the oxygen consumption per BOD removal could be smaller than that of the activated sludge system especially when the S-BOD/Total-BOD(T-BOD) ratio was small. (author abst.)

L54 ANSWER 13 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 122:224856 HCA
TITLE: Tritium purification via zirconium-**manganese** -**iron** alloy getter St 909 in flow processes
AUTHOR(S): Baker, J. D.; Meikrantz, D. H.; Pawelko, r. J.; Anderl, R. A.; Tuggle, d. G.
CORPORATE SOURCE: Idaho Natl. Eng. Lab., EG and G Idaho, Inc., Idaho Falls, ID, 83415-7111, USA
SOURCE: Fusion Technology (1995), 27(2T), 8-13
CODEN: FUSTE8; ISSN: 0748-1896
PUBLISHER: American Nuclear Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A Zr-**Mn**-**Fe** alloy, St 909, was evaluated as a purifier in tritium handling, transport, and storage applications. High efficiency removal of CH4, CO, CO2, **NH3**, and **O2** was observed at concns. of 0.1-1% in He. Gas streams at 100-5000 sccm were passed through getters operated at 600-800°. On-getter residence times of 2 s were required to achieve >99% removal of these reactive impurities. At this removal efficiency level, the individual impurity capacity of 100 g of St 909 purifier at 800° was 0.59, 0.28, 0.19, 0.14 and 0.12 mol of CH4, CO, CO2, **O2** and **NH3**, resp. Hydrogen containing gasses; CH4 and **NH3**; were cracked on the purifier and the resultant elemental hydrogen was released. Only 8 ± 2 scc of H2 were retained on 100 g of St 909 at 800°. These features suggest that this alloy can be employed as an efficient purifier for hydrogen isotopes in inert gas, nitrogen, or perhaps even H, D, or T streams.

CC 71-6 (Nuclear Technology)
Section cross-reference(s): 56

ST tritium purifn St909 getter; zirconium **manganese iron** alloy getter tritium

IT 74-82-8, Methane, processes **7664-41-7**, **Ammonia**, processes

RL: RCT (Reactant); REM (Removal or disposal); PROC (Process); RACT (Reactant or reagent)
(reactive impurities; evaluation of St 909 as a purifier in tritium handling, transport, and storage applications)

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes
7782-44-7, Oxygen, processes
RL: **REM (Removal or disposal)**; PROC (Process)
(reactive **impurities**; evaluation of St 909 as a purifier in tritium handling, transport, and storage applications)

L54 ANSWER 14 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 121:259089 HCA
TITLE: Low-cost process for generating controlled atmospheres
for heat-treating furnaces from noncryogenically produced impure nitrogen
INVENTOR(S): Epting, Michael J.
PATENT ASSIGNEE(S): Air Products and Chemicals, Inc., USA
SOURCE: U.S., 10 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5322676	A	19940621	US 1992-995656	19921222
CA 2111498	AA	19940623	CA 1993-2111498	19931215

PRIORITY APPLN. INFO.: US 1992-995656 19921222

AB The process comprises mixing noncryogenically produced N containing 0.05-5.0 volume% residual **O** with excess reducing gas, e.g., H, **NH3**, a C-, H-, and ≥1 **O**-containing hydrocarbons selected from alcs., ethers, aldehydes, ketones, Me2CO, etc., passing the mixture at 100-950° through an **NH3** dissociator containing a Ni and/or **Fe** catalyst to convert the residual **O** into moisture, CO, and CO2, and using the resultant gaseous mixture for annealing and heat-treating ferrous and nonferrous metals and alloys, brazing metals and ceramics, sealing glass to metal, and sintering metal and ceramic powders.

IC ICM C01B021-04
NCL 423351000
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 55, 57

ST controlled atm heat treating furnace; **oxygen** removal nitrogen controlled atm; hydrogen **oxygen** removal nitrogen; **ammonia oxygen removal** nitrogen; hydrocarbon **oxygen** removal nitrogen; methanol **oxygen** removal nitrogen; copper alloy annealing controlled atm; gold alloy annealing controlled atm; carbon steel annealing controlled atm

IT Controlled atmospheres
(manufacture of, from noncryogenically produced **impure** nitrogen, **oxygen** removal in, by combustion, for annealing and heat-treating operations)

IT Alcohols, reactions
Aldehydes, reactions
Ethers, reactions
Ketones, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(removal with, of **oxygen**, from noncryogenically produced nitrogen, for controlled atms. for annealing and heat-treating operations)

IT 7727-37-9P, Nitrogen, preparation
RL: PREP (Preparation)
(**oxygen** removal from noncryogenically produced, by combustion, for controlled atms. for annealing and heat-treating operations)

IT **7782-44-7, Oxygen**, uses
RL: **REM (Removal or disposal)**; PROC (Process)
(removal of, from noncryogenically produced nitrogen, by combustion, for controlled atms. for annealing and heat-treating operations)

IT 67-56-1, Methanol, reactions 67-64-1, Acetone, reactions 1333-74-0, Hydrogen, reactions **7664-41-7, Ammonia**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**removal** with, of **oxygen**, from noncryogenically produced nitrogen, for controlled atms. for annealing and heat-treating operations)

L54 ANSWER 15 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER:	123:61165 HCA
TITLE:	Sulfur and **oxygen** removal from semi water gas
INVENTOR(S):	Wei, Xionghui
PATENT ASSIGNEE(S):	Peop. Rep. China
SOURCE:	Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp. CODEN: CNXXEV
DOCUMENT TYPE:	Patent
LANGUAGE:	Chinese
FAMILY ACC. NUM. COUNT:	1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1087110	A	19940525	CN 1992-112970	19921116

PRIORITY APPLN. INFO.: CN 1992-112970
19921116

AB A solution of ferrous salt in an HOAc-**NH3** buffer containing Fe3+ is used for the removal of S and **O** from semi water gas. The solution may also be used to remove S in urea and ammonium bicarbonate manufacture

IC ICM C10K001-10

CC 51-20 (Fossil Fuels, Derivatives, and Related Products)

ST semi water gas sulfur removal; **oxygen** removal semi water gas

IT Fuel gases
(water gas, semi; **iron** salt solns. in acetic acid-**ammonia** buffers for sulfur and **oxygen removal** from semi water gas)

IT 64-19-7, Acetic acid, uses **7439-89-6D, Iron**, salts **7664-41-7, Ammonia**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**iron** salt solns. in acetic acid-**ammonia** buffers for sulfur and **oxygen removal** from semi water gas)

IT **7782-44-7, Oxygen**, processes 7783-06-4, Hydrogen sulfide, processes
RL: **REM (Removal or disposal)**; PROC (Process)
(**iron** salt solns. in acetic acid-**ammonia** buffers for sulfur and **oxygen removal** from semi water gas)

IT 57-13-6, Urea, miscellaneous 1066-33-7, Ammonium bicarbonate
RL: MSC (Miscellaneous)
(**iron** salt solns. in acetic acid-**ammonia** buffers for sulfur and **oxygen removal** in urea manufacture)

L54 ANSWER 16 OF 22 JICST-EPlus COPYRIGHT 2004 JST on STN

ACCESSION NUMBER: 930632814 JICST-EPlus

TITLE: Water Treatment System and Water Quality Control at Aquarium.

AUTHOR: IWAIZUMI TAKASHI

CORPORATE SOURCE: Ebara-Infilco Co., Ltd.

SOURCE: Kuki Chowa, Eisei Kogaku, (1993) vol. 67, no. 7, pp. 485-491. Journal Code: F0331A (Fig. 11, Tbl. 3, Ref. 4)
CODEN: KCEKA6; ISSN: 0386-4081

PUB. COUNTRY: Japan

DOCUMENT TYPE: Journal; Commentary

LANGUAGE: Japanese

STATUS: New

AB For breeding of aquatic life in an aquarium, it is a key point to create

an artificial environment which is suitable for the aquatic life. Especially, it is important to keep temperature and quality of breeding water in stable conditions. Recirculation systems with sand filters are nowadays popular as breeding water treatment facilities for aqualia. They can remove turbidity, nitrify **ammonia**, supply dissolved **oxygen** and **remove** algea or bacteria. The author summarizes recent technologies for the recirculation type breeding water treatment facilities, sea water treatment facilities for make-up water conditioning and wastewater treatment facilities for aqualia. Some important equipment and materials for the facilities are also referred to. (author abst.)

L54 ANSWER 17 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 117:174549 HCA
TITLE: Purification of **ammonia** by using zirconium-vanadium-**iron** alloy
INVENTOR(S): Succi, Marco; Solcia, Carolina
PATENT ASSIGNEE(S): Saes Getters S.p.A., Italy
SOURCE: Eur. Pat. Appl., 6 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 484301	A1	19920506	EP 1991-830475	19911031
EP 484301	B1	19941012		
R: DE, FR, GB, NL				
JP 04292413	A2	19921016	JP 1991-313165	19911101

PRIORITY APPLN. INFO.: IT 1990-21958 A 19901102

AB Impurity-containing **NH3** is passed through a Zr-V-**Fe** alloy at >300° for 10 min then cooled to <150° (a temperature at which there is no appreciable dissociation of **NH3**) to give a purified **NH3**.

IC ICM C01C001-02
CC 49-8 (Industrial Inorganic Chemicals)
ST **oxygen removal ammonia** alloy **sorbent** ; water removal **ammonia** alloy sorbent
IT Drying
(dewatering, of **ammonia**, heated **iron**

-vanadium-zirconium alloy for)

IT 75846-81-0
RL: USES (Uses)
(heated, water and **oxygen removal** by, in **ammonia** purification)

IT **7664-41-7P, Ammonia**, preparation
RL: **PUR (Purification or recovery); PREP (Preparation)**
(purification of, water and **oxygen removal** in, zirconium-vanadium-**iron** alloy for)

IT **7782-44-7, Oxygen**, miscellaneous
RL: **REM (Removal or disposal); PROC (Process)**
(**removal** of, from **ammonia**, heated **iron** -vanadium-zirconium alloy for)

L54 ANSWER 18 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 104:112127 HCA
TITLE: Manufacture of **oxygen**-free nitrogen
INVENTOR(S): Iimura, Toshimitsu; Yamazaki, Norio; Minagawa, Isamu
PATENT ASSIGNEE(S): Taiyo Sanso Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 60166206	A2	19850829	JP 1984-19250	19840203

PRIORITY APPLN. INFO.: JP 1984-19250 19840203

AB **O**-free N2 (<1 ppm **O**) is manufactured by addition of **NH3** at equivalent amount in 4:3 (mol. ratio) **NH3-O2** in N2 and oxidation (180-190°) of **NH3** over a catalyst of 15-85:15-85 (weight ratio) **Mn** oxide-spinel type crystal (e.g., V, Cr, **Fe**, Co, Ni, Cu, Zn, Mo, W, or Au).

IC ICM C01B021-04
ICS B01J023-34; B01J023-68; B01J023-84

CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 49

ST nitrogen manuf **oxygen** free; **oxygen** removal nitrogen manuf; **ammonia** oxidn catalyst nitrogen purifn; **manganese** oxide catalyst nitrogen purifn; spinel crystal catalyst nitrogen purifn

IT Spinel-type crystals
(catalysts containing **manganese** oxide and, for **ammonia** oxidation, in nitrogen purification)

IT Oxidation catalysts
(**manganese** oxide-spinel crystal metals, for **ammonia**, in nitrogen purification)
IT Air
(nitrogen enrichment of, manufacture of **oxygen**-free nitrogen in, by **ammonia** oxidation)
IT **7439-89-6**, uses and miscellaneous 7439-98-7, uses and miscellaneous 7440-02-0, uses and miscellaneous 7440-22-4, uses and miscellaneous 7440-33-7, uses and miscellaneous 7440-47-3, uses and miscellaneous 7440-48-4, uses and miscellaneous 7440-50-8, uses and miscellaneous 7440-62-2, uses and miscellaneous 7440-66-6, uses and miscellaneous
RL: USES (Uses)
(catalysts containing **manganese** oxide and, for oxidation of **ammonia**, in nitrogen purification)
IT **7439-96-5D**, oxides
RL: CAT (Catalyst use); USES (Uses)
(oxidation catalysts containing, for **ammonia**, in purification of nitrogen)
IT **7664-41-7**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, catalysts for, in nitrogen purification)
IT 7727-37-9P, preparation
RL: **PUR (Purification or recovery); PREP (Preparation)**
(purification of, in **removal** of **oxygen**, by **ammonia** oxidation)
IT **7782-44-7**, uses and miscellaneous
RL: **REM (Removal or disposal); PROC (Process)**
(**removal** of, in nitrogen purification, by **ammonia** oxidation)

L54 ANSWER 19 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 93:222536 HCA
TITLE: Catalytic **ammonia** decomposition and the **removal** of **oxygen** and water vapor from nitrogen-hydrogen mixtures
AUTHOR(S): Zlatkov, P.
CORPORATE SOURCE: Bulg.
SOURCE: Khimiya i Industriya (1922-1988) (1980), (5), 214-15
CODEN: KINSAF; ISSN: 0368-5764
DOCUMENT TYPE: Journal
LANGUAGE: Bulgarian
AB **NH3** is decomposed to N2 + H2 over an **Fe** catalyst at

680-700°. The **O2** is removed by using a highly active Pd catalyst. H2O and **NH3** are removed with mol. sieve Ca5A. The catalyst is an Al2O3 carrier containing Fe2O3 63.9, FeO 30.1, Al2O3 4.0, K2O 1.6, and S 0.4%. When **NH3** containing 0.2-1% H2O is decomposed a N2 + H2 mixture containing 0.0001 volume% **O2** having a dew point of -75° is prepared

CC 49-1 (Industrial Inorganic Chemicals)

ST hydrogen nitrogen prepn catalyst; **ammonia** decompn catalyst; **oxygen** removal; water vapor removal; **iron** catalyst

IT Dissociation catalysts
(**iron**, for **ammonia**)

IT Catalysts and Catalysis
(palladium, for **oxygen** removal from hydrogen-containing gases)

IT **7439-89-6**, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **ammonia** decomposition)

IT 7440-05-3, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for **oxygen** removal from hydrogen-containing gas)

IT **7664-41-7**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(decomposition of, with **iron** catalyst, **oxygen** and water removal in)

IT 1333-74-0P, preparation 7727-37-9P, preparation
RL: **PREP (Preparation)**
(preparation of, by **ammonia** decomposition, **iron** catalyst for)

IT **7782-44-7**, uses and miscellaneous
RL: **REM (Removal or disposal); PROC (Process)**
(removal of, from hydrogen-containing gases, palladium catalysts in)

L54 ANSWER 20 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 87:123350 HCA

TITLE: **Ammonia** combustion catalysts

INVENTOR(S): Taura, Teruchika

PATENT ASSIGNEE(S): Nippon Junsuiso Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 52065192	A2	19770530	JP 1975-140950	19751125
JP 55040052	B4	19801015		

PRIORITY APPLN. INFO.: JP 1975-140950
19751125

AB Catalyst carriers made of alloys containing Cr and Ni are etch treated, then coated with Pd and heated in H to give **NH3** combustion catalysts. The catalysts have good durability and good catalytic activity, and the combustion of **NH3**-air mixture produces N-H2O mixture containing no NOx. Thus, a outer surface of SUS 42 (containing 20% Ni and 25% Cr) tube (outer diameter 10, inner diameter 8, length 625 mm) was coated with an acid-resistant resin, the tube was immersed 20 min in aqueous 10 weight % HCl solution at 70-80° to remove 13.04 weight % of the steel tube, the inner wall of the tube was electroplated with Pd from an electrolyte containing PdCl2.2H2O 3.7, Na2HPO4.12H2O 100, (NH4)2HPO4 20, and benzoic acid 2.5g/L, and the tube was heated at 750-850° for 30 min while H was passed through the tube to give a reaction tube having catalytic inner wall. The amount of Pd in the tube was 0.16 weight %. Air containing 23.5 volume % **NH3** was then passed through the tube (at 700-860°) at a space velocity (of product gas) of 20,000 h-1: the **NH3**, NOx, and **O** in product gas were 0.5 volume %, **O** ppm, and ≤1.0ppm, resp.

IC B01J023-86

CC 67-1 (Catalysis and Reaction Kinetics)
Section cross-reference(s): 48

ST **ammonia** combustion catalyst; palladium catalyst **ammonia** combustion; **oxygen removal** catalyst **ammonia**

IT Air
(**oxygen removal** from, by combustion of **ammonia**, catalysts for)

IT Combustion catalysts
(palladium-leached **iron** alloy, for **ammonia** in air)

IT 37301-67-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst manufacture from, for combustion of **ammonia**)

IT 7440-05-3, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for combustion of **ammonia**)

IT **7664-41-7**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(combustion of, palladium-leached alloy catalyst for)

IT **7782-44-7**, uses and miscellaneous

RL: **REM (Removal or disposal)**; PROC (Process)
(removal of, from air by combustion of **ammonia**, catalyst for)

L54 ANSWER 21 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
ACCESSION NUMBER: 1977-13792Y [08] WPIX
TITLE: Nitrogen oxides removal from gas also containing sulphur
oxides and oxygen - by mixing with ammonia in presence of
catalyst formed by supporting base metal component on cation-exchanged synthetic zeolite.
DERWENT CLASS: E36 J01
PATENT ASSIGNEE(S): (TOFU) TOA NENRYO KOGYO KK
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
JP 52004469	A	19770113	(197708)*		
JP 58014251	B	19830318	(198315)		

PRIORITY APPLN. INFO: JP 1975-21339 19750221; JP 1976-58229 19770606
AN 1977-13792Y [08] WPIX
AB JP 52004469 A UPAB: 19930901
Synthetic zeolite (e.g. synthetic faujasite or synthetic mordenite) is dealkalised to form hydrogen type synthetic zeolite containing alkali metal of
0.2-0.6 equivalent pref. 0.2-0.4 equivalent, per gram-atom of aluminium. Using
this as carrier, one or more base metal components (e.g. sulphate of copper or **iron**, oxide of chromium or vanadium, etc.) are
supported on it by impregnation under conditions causing no ion-exchange,
obtaining a catalyst.
The gas containing harmful nitrogen oxides is mixed with ammonia, and the
mixed gas is contacted with the catalyst. The catalyst exhibits excellent
activity and selectivity of long life at low temperature and high space
velocity.

L54 ANSWER 22 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
ACCESSION NUMBER: 1977-83153Y [47] WPIX
TITLE: Nitric oxide removal from nitrogen containing oxygen and opt.

steam - by reduction with ammonia over copper, nickel,

manganese oxide catalyst.

DERWENT CLASS: E36 J01
PATENT ASSIGNEE(S): (FARH) HOECHST AG
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
DE 2620378	A	19771117	(197747)*		
DE 2620378	C	19851121	(198548)		

PRIORITY APPLN. INFO: DE 1976-2620378 19760508
AN 1977-83153Y [47] WPIX
AB DE 2620378 A UPAB: 19930901
Selective removal involves reduction of N oxides (I) with excess ammonia (II)
at 180-250 degrees C in the presence of a catalyst (III) consisting of a
homogeneous mixture of oxides of Cu, Ni and Mn, each in a weight ratio between
0.1 and 1, pref. 1:1:1:. Only a relatively slight (1.1-10, especially 1.1-2.4
fold) stoichiometric excess of (II) is needed.
The gas mixture contains 300-5000 ppm. (I), 0.5-5 volume % O and 0-3 volume
% steam. (III) can be used alone as pellets or as mixture of 2-40 weight %
(III) on an inert support. E.g. the NO content of a gas mixture was reduced
from 1000 to under 10 ppm. by reduction with (II) over (III) on alpha-alumina.

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